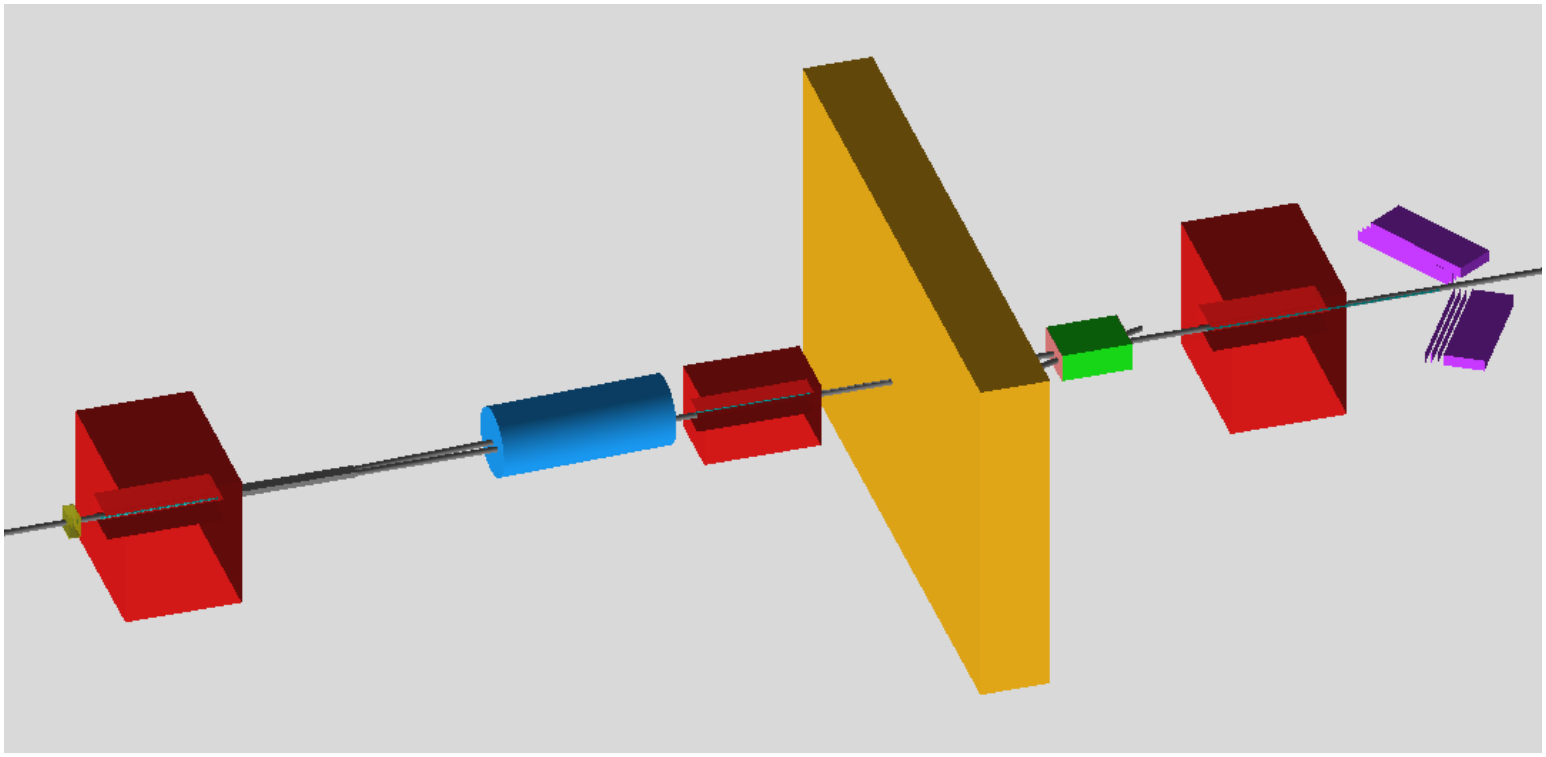
Magnet after beam dump

Magnet:
- 1.4 T;
- Length: 1 m;
- Drift: 0.7 m;

Distance
Target – IP: 9 m.

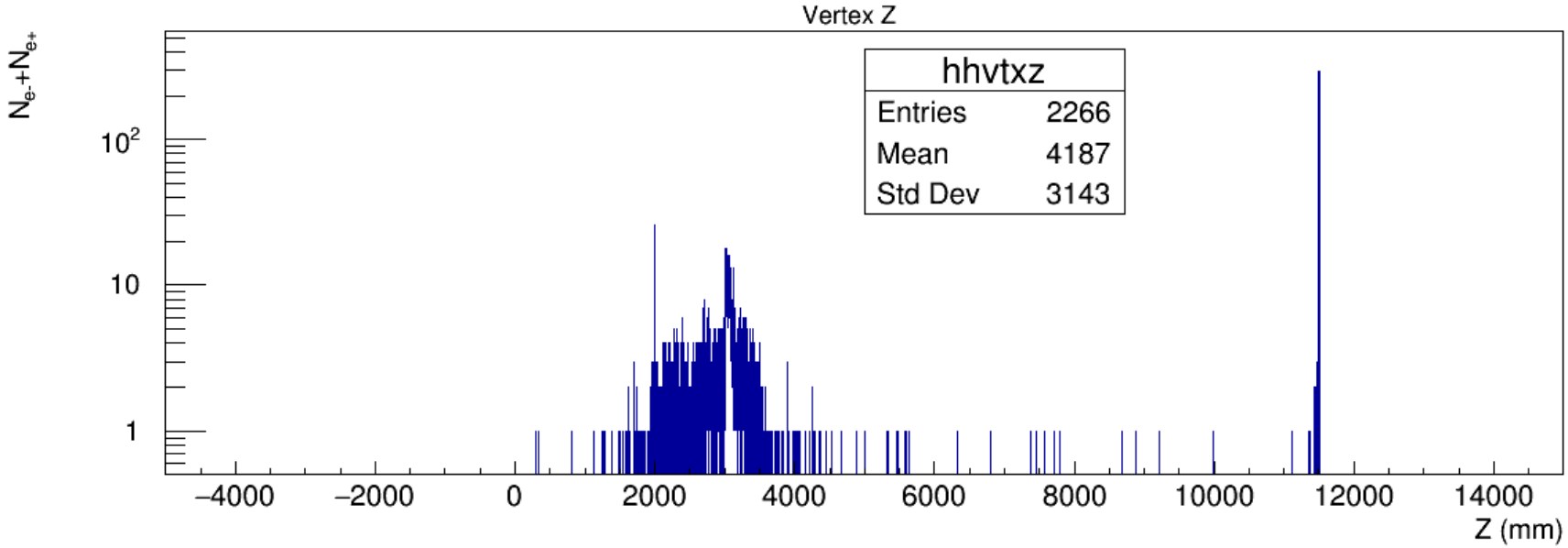


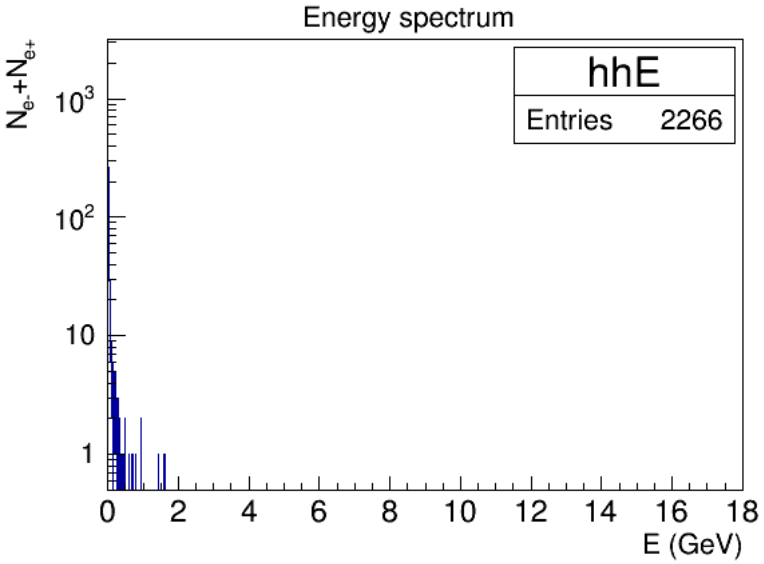
E (GeV)	Magnet (T)	R (m)	Magnet length (m)	Drift (m)	X (cm)
17.5	15	3.9	0.3	0.35	3.86
17.5	2	29.2	1	0.6	3.77
17.5	1.4	41.7	1	0.7	2.88
8	1.4	19.06	1	0.7	6.3

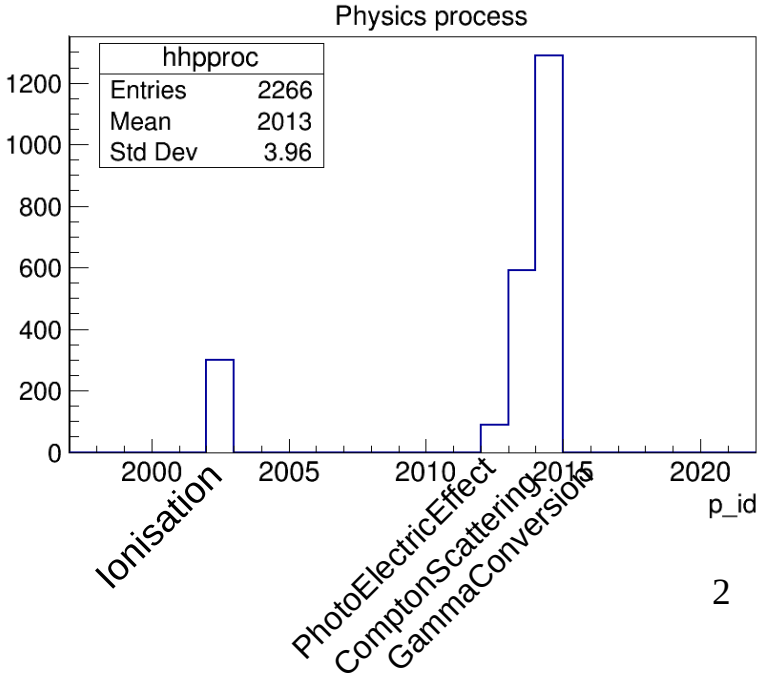
Background with magnet between dump and shielding

Production vertexes, processes and spectra of e+, e- hitting the detector volume

1.278e9 e-

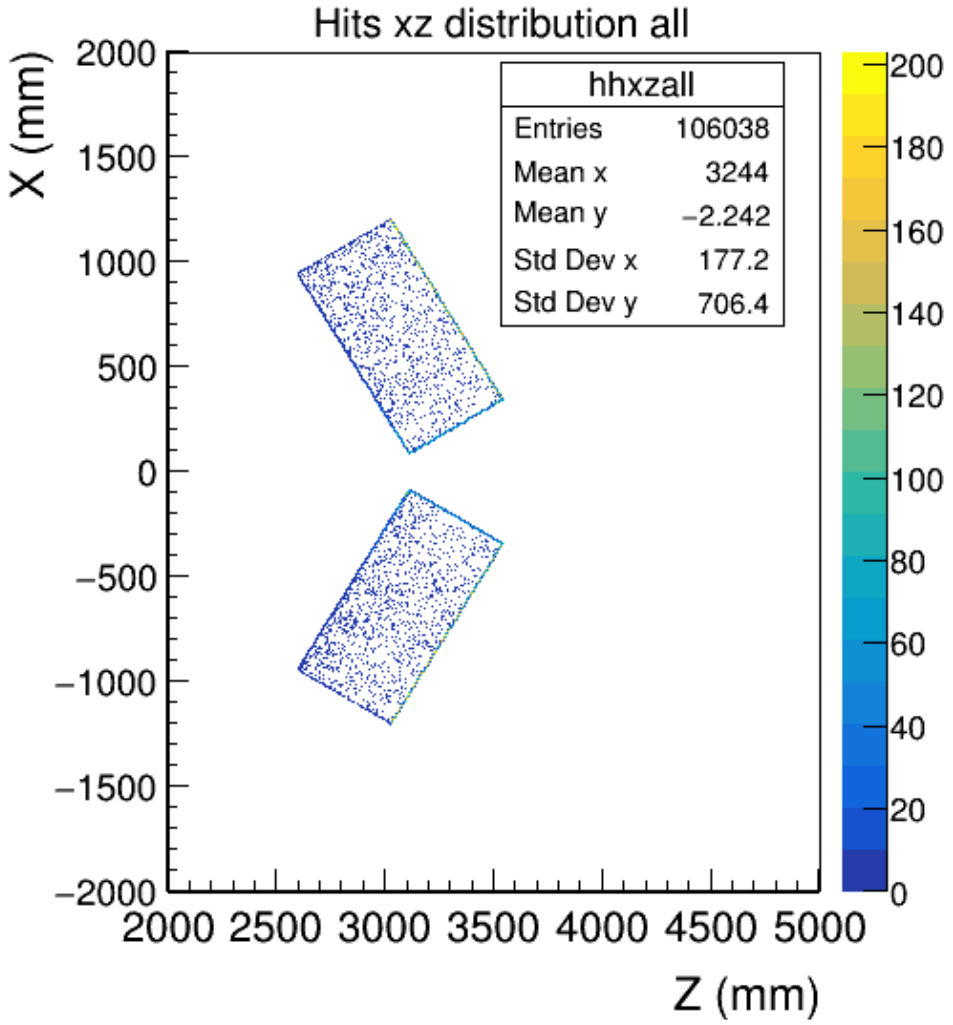


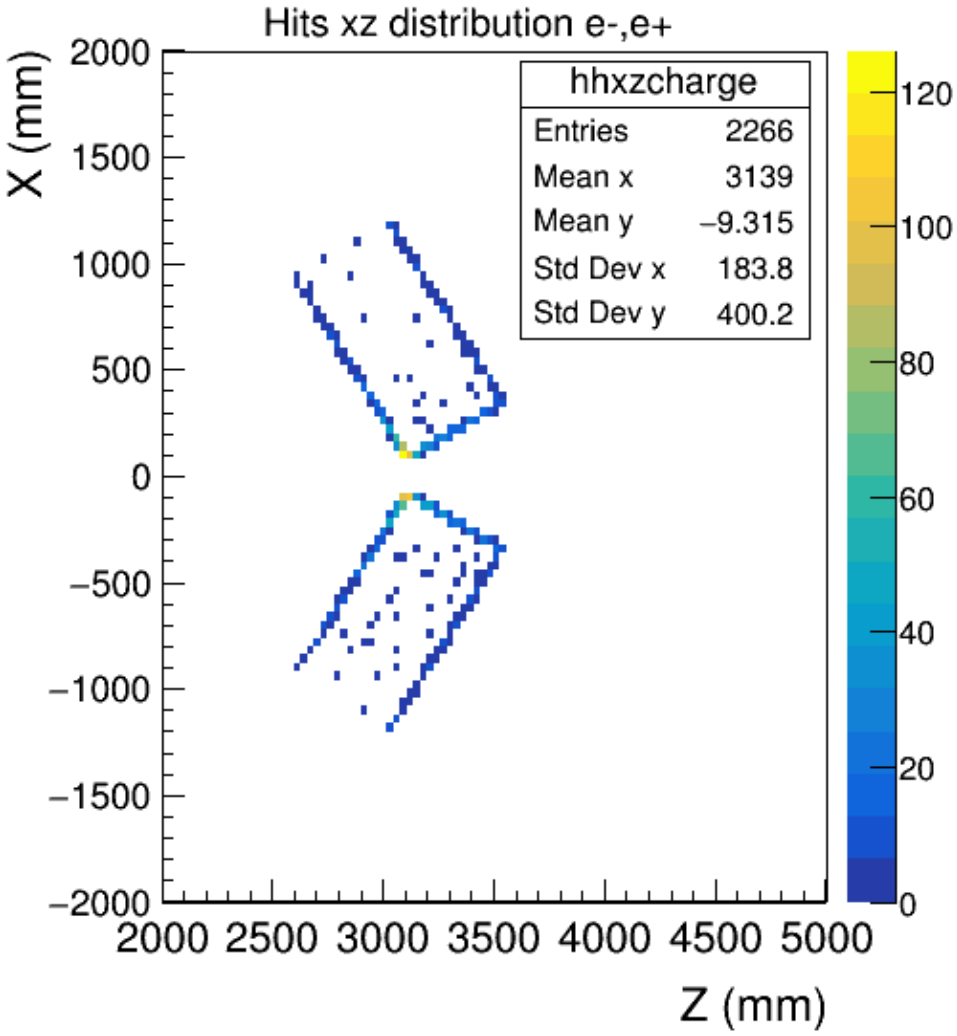




Background with magnet between dump and shielding

Hits distribution on detector volume surfaces

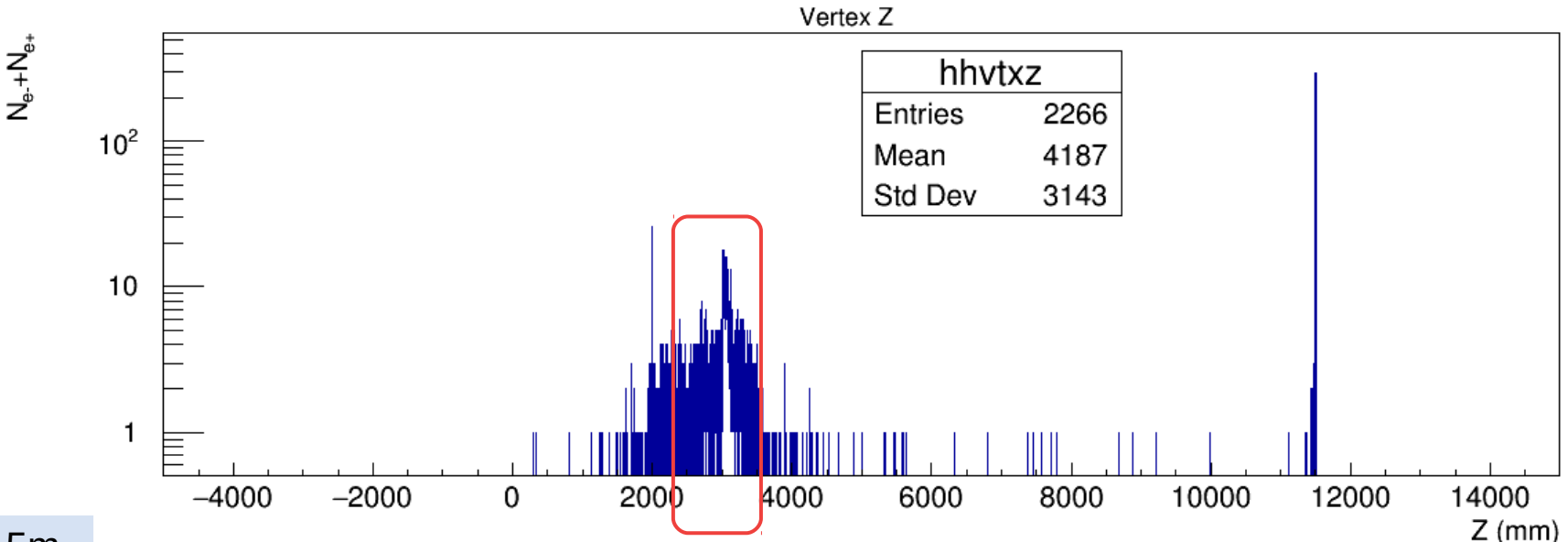




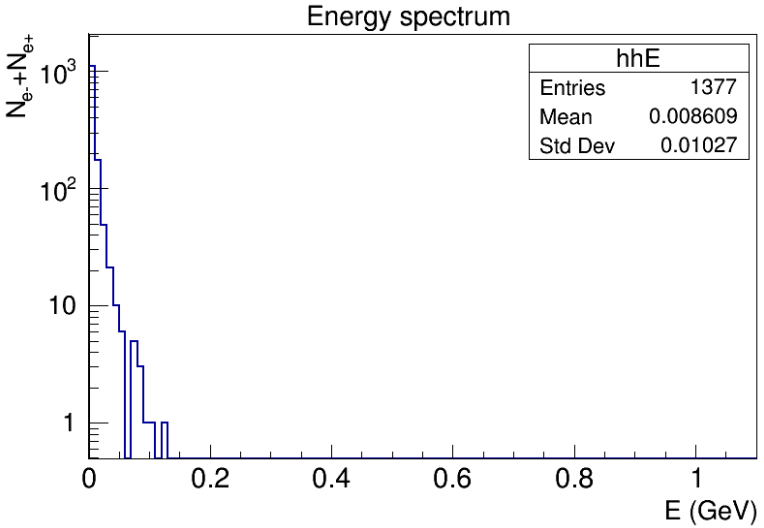
Background with magnet between dump and shielding

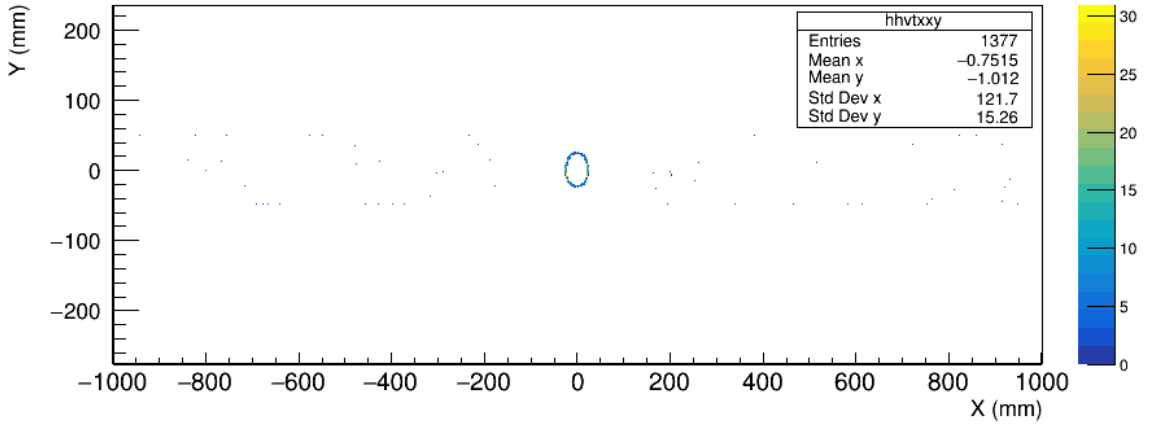
Production vertexes and spectra of e+, e- hitting the detector volume

1.278e9 e-



2.5m < z_vtx < 3.5m

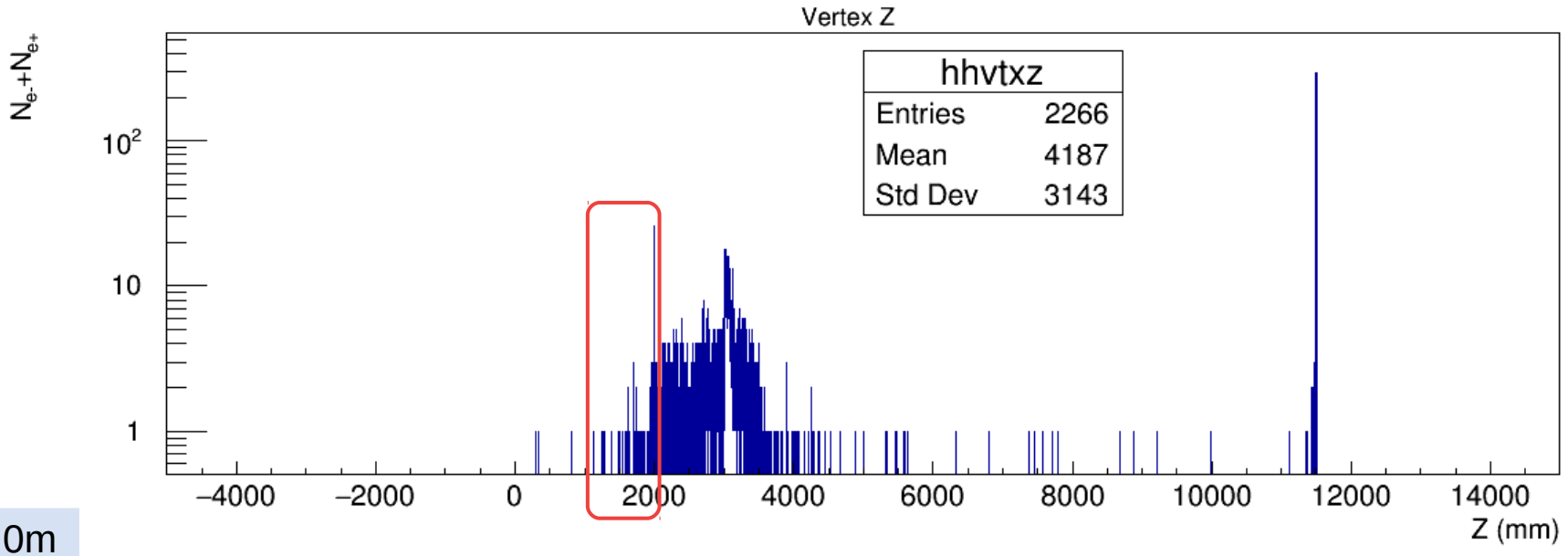




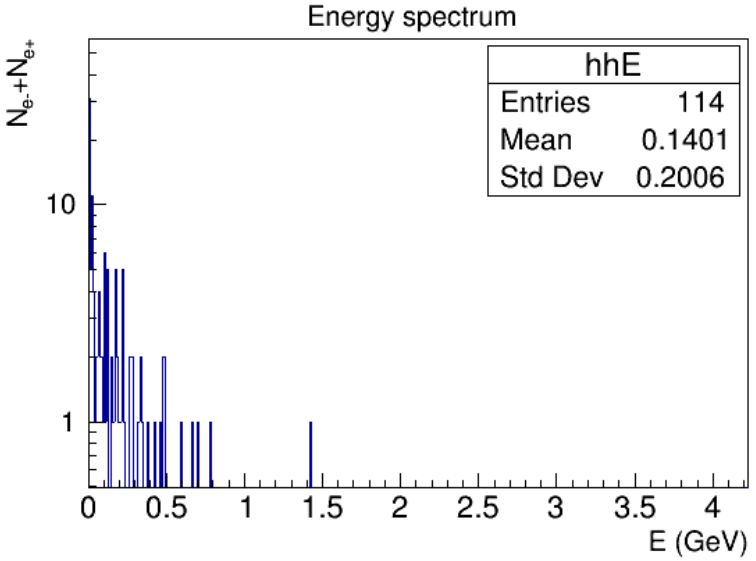
Background with magnet between dump and shielding

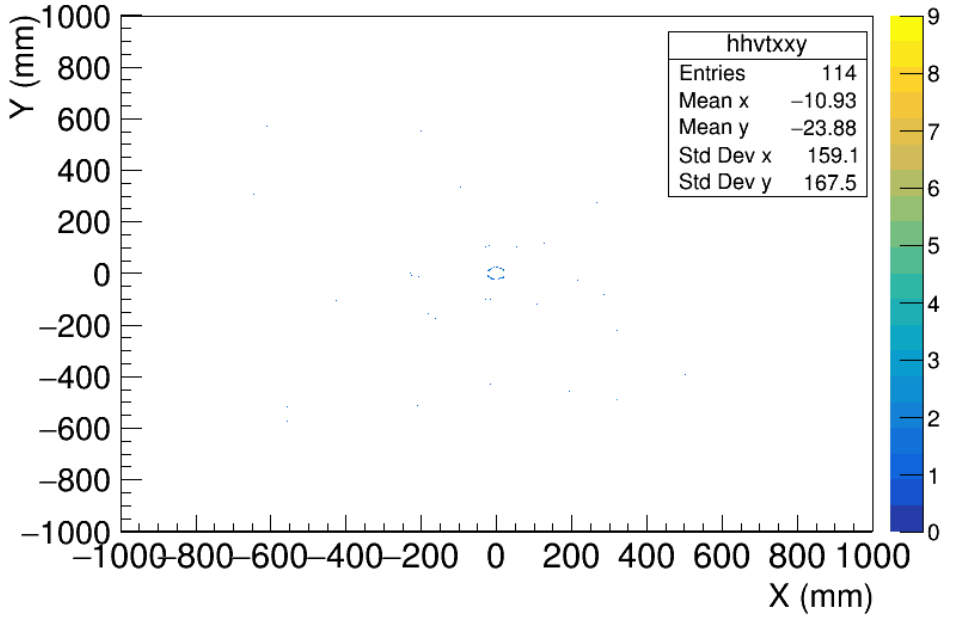
Production vertexes and spectra of e+, e- hitting the detector volume

1.278e9 e-



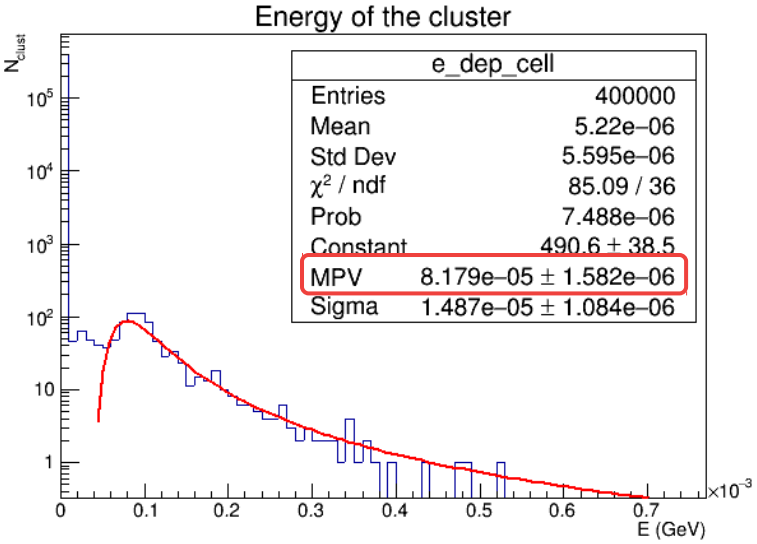
1.0 m < z_vtx < 2.0m

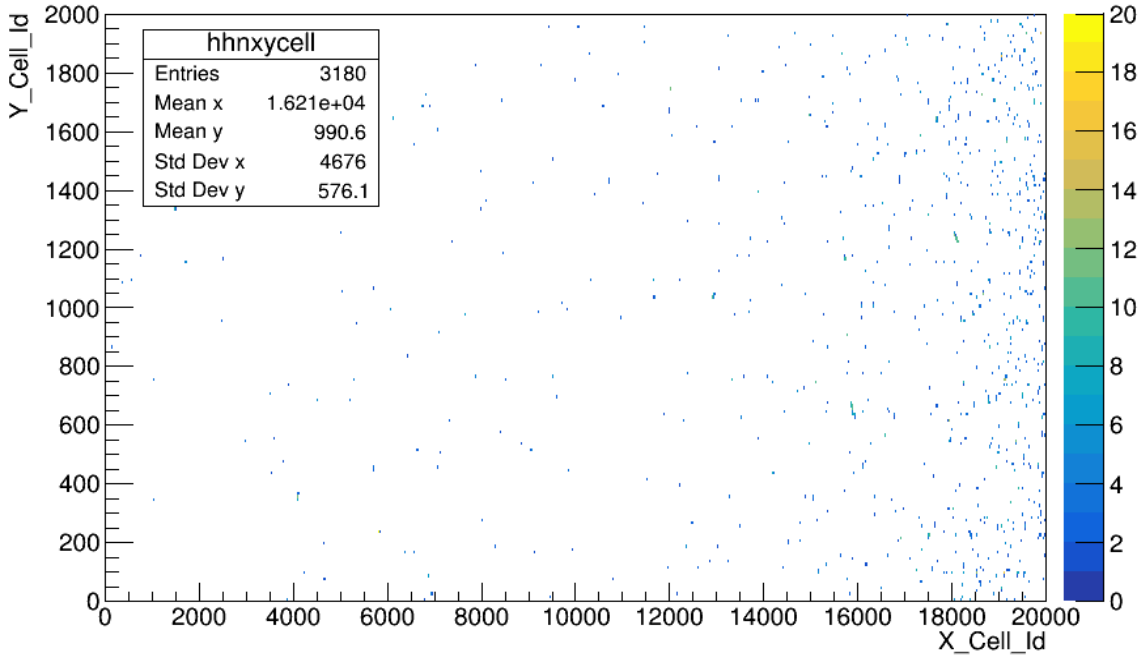


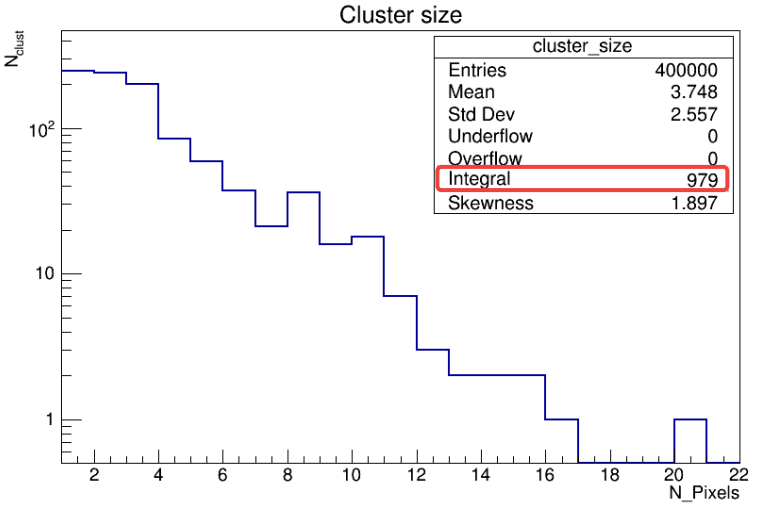


First Plane of the Tracking Detector

- Simplified estimative clustering:
  - Combined 10 pixels in x and y;
- MPV of Landau distribution looks consistent with known value for 300 μm of silicon (~84 keV);
- Average number of clusters from the background is $979/10^5 mm^2 \sim 10^{-2} mm^{-2}$;
- Distribution is not uniform with higher density closer to the beam axis.







Summary

- 1.278 electrons were simulated in geometry with 1m long 1.4T magnet after the beam dump;
- No e+, e- produced before IP are observed in detectors;
- 2266 of e+, e- are crossing the surface of the detector volumes. Their energy is mostly below 1 GeV.
- More than half of them (1377) are produced in the are of detectors;
- Small fraction (114) is produced in the magnet area;
- Others are generated behind the detector volumes;
- Front plane of the tracking detector in average has about 1 clusters per cm^2 produced by low energy background e+ ,e-.

- Study carefully background e+, e- produced in the area of detectors;
- Study effect of detector alignment with respect to beam pipe and their geometry on the background level;
- XY distribution of the vertexes shows substantial contribution of the beam pipe in background production;
- Try wider beam pipe in the magnet area and maybe thicker in detector area.